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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,043	03/24/2000	Toshiaki Shinozaki	0057-2608-2YY	3123

7590

09/11/2002

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EXAMINER

CHU, CHRIS C

ART UNIT

PAPER NUMBER

2815

DATE MAILED 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/534,043

Examiner

Chris C. Chu

Applicant(s)

SHINOHARA ET AL.

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3 - 8, 13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7, 13 and 14 is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6 and 8 is/are rejected.
- 7) ☒ Claim(s) 3 and 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 26 June 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. The applicant's amendment filed on June 19, 2002 has been received and entered in this office action.

Claim Objections

2. Claim 8 is objected to because of the following informalities: remove "and" in line 7. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al. in view of McCormick.

Regarding claim 1, Hirose et al. discloses in Fig. 16B and column 10, lines 16 ~ 19 a semiconductor module mountable on an external heat sink (5), the semiconductor module comprising:

- an insulating substrate (1, 11 and 8) for the semiconductor module, the insulating substrate (1, 11 and 8) including a substrate (1), a first conductive pattern (8) formed on a first main surface of the substrate which is on the opposite side from the external heat sink, and a second conductive pattern (11) formed on a second main surface of the substrate which is on the same side as the external heat sink and for contact with the external heat sink; and
- a mounting frame (3) made of metal and having a mounting surface for contact with the external heat sink, the mounting frame (3) including a flange along a periphery thereof for engagement with a peripheral part of the insulating substrate at the first main surface, the flange pressing the peripheral part of the insulating substrate toward the external heat sink.

As to the language on lines 10 ~ 12 of claim 1, the phrase “to force the insulating substrate into pressure contact with the external heat sink” is functional language which does not differentiate the claimed apparatus from Hirose et al.

Hirose et al. does not disclose the mounting frame which includes: a first metal plate and a second metal plate

McCormick discloses in Fig. 2A a mounting frame which includes:

- a first metal plate (220) having a mounting surface and

- a second metal plate (206) disposed on the first metal plate and having a protrusion along a periphery thereof projecting from a periphery of the first metal plate to define a flange.

It would have been obvious to one of ordinary skill in the art at the time of the present invention was made to use the first metal plate and the second metal plate of McCormick as the mounting frame in the device of Hirose et al. in order to provide a technique of tape-mounting a semiconductor device as taught by McCormick in column 9, lines 48 ~ 50.

Regarding claim 4, Hirose et al. discloses in Fig. 16B the insulating substrate (1) further includes a third conductive pattern (2) formed on the first main surface along a periphery of the substrate; and the flange and the insulating substrate (1) contact each other, with the third conductive pattern (2) therebetween.

Regarding claim 6, Hirose et al. discloses in Fig. 16B the insulating substrate (1) further includes a third conductive pattern (2) formed on the first main surface along a periphery of the substrate; and the flange and the insulating substrate (1) contact each other, with the third conductive pattern (2) therebetween.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose et al. in view of Mertol.

Hirose et al. discloses in Fig. 16B and column 10, lines 16 ~ 19 a semiconductor module mountable on an external heat sink (5), the semiconductor module comprising:

- an insulating substrate (1, 11, and 8) for the semiconductor module, the insulating substrate (1, 11, and 8) including a substrate (1), a first conductive pattern (8) formed

on a first main surface of the substrate which is on the opposite side from the external heat sink, and a second conductive pattern (11) formed on a second main surface of the substrate which is on the same side as the external heat sink and for contact with the external heat sink;

- a mounting frame (3) made of metal and having a mounting surface for contact with the external heat sink, the mounting frame (3) including a flange along a periphery thereof for engagement with a peripheral part of the insulating substrate at the first main surface, the flange pressing the peripheral part of the insulating substrate toward the external heat sink to force the insulating substrate into pressure contact with the external heat sink,
- wherein the substrate, the first conductive pattern and the second conductive pattern of the insulating substrate have respective peripheries in alignment with each other, and
- wherein the flange presses the periphery of the first conductive pattern on which a semiconductor element is mounted toward the external heat sink.

Hirose et al. does not disclose an insulative material between the flange and the first conductive pattern. However, Mertol discloses in Fig. 8 an insulative material (6) between the flange (16) and the first conductive pattern. It would have been obvious to one of ordinary skill in the art at the time of the present invention was made to add the insulative material of Mertol in the device of Hirose et al. in order to increase security of the stiffener to the substrate as taught by Mertol in column 7, lines 37 ~ 39.

Allowable Subject Matter

6. Claims 7, 13 and 14 are allowed (see previous office action).
7. Claims 3 and 5 are objected (see previous office action).

Response to Arguments

8. Applicant's arguments filed on June 26, 2002 have been fully considered but they are not persuasive.

On page 6, 4th paragraph, applicant argues "McCormick identifies element 206 ... it is clear that the lower conductive layer 220 is not disposed on the first metal layer 206. Rather, an insulating material 210 separates the lower conductive layer 220 and the first metal layer 206." The argument is not persuasive. It should be noted that the claims are open ended due to the term "comprising." Therefore, whether McCormick discloses additional structure or not is not relevant since McCormick discloses the claimed structure.

Further, on page 7, 1st paragraph, applicant argues "first metal plate to be 220 and second metal plate to be 206, McCormick neither teaches nor suggests that ... (ii) having a protrusion along a periphery thereof projecting from a periphery of the first metal plate to define the flange as recited in claim 1 of the present invention." The argument is not persuasive. McCormick clearly shows in Fig. 2A a first metal plate (220) and second metal plate (206) having a protrusion along a periphery thereof projecting from a periphery of the first metal plate to define the flange.

Furthermore, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Contrary to applicant's assertion and as stated in the rejection, motivation was established by McCormick, specifically in column 9, lines 48 ~ 50.

Even further, in response to applicant's arguments, the functional recitation that "to force the insulating substrate into pressure contact with the external heat sink" has not been given weight because the functional recitation does not differentiate the claimed apparatus from Hirose et al. Without additional limitation added to the claims no distinction can be ascertained.

Finally, in response to applicant's arguments against the references (Mertol and Hirose et al.) individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Application/Control Number: 09/534,043
Art Unit: 2815

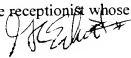
Page 8

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Chris C. Chu
Examiner
Art Unit 2815

c.c.
September 6, 2002